Inaction inertia in retirement saving

Krijnen, Job M.T.; Zeelenberg, Marcel; Breugelmans, Seger M.; van Putten, Marijke

published in
Journal of Behavioral Decision Making
2020

DOI (link to publisher)
10.1002/bdm.2145

document version
Publisher's PDF, also known as Version of record

Received: 12 March 2018 | Revised: 21 June 2019 | Accepted: 21 June 2019

DOI: 10.1002/bdm.2145

RESEARCH ARTICLE

WILEY

Inaction inertia in retirement saving

Job M.T. Krijnen[1] | Marcel Zeelenberg[2,3] | Seger M. Breugelmans[2] | Marijke van Putten[4]

[1] UCLA Anderson School of Management, Los Angeles, CA, USA

[2] Tilburg University, Tilburg, The Netherlands

[3] Vrije Universiteit Amsterdam, Amsterdam, the Netherlands

[4] Leiden University, Leiden, The Netherlands

Correspondence
Job M. T. Krijnen, UCLA Anderson School of Management, 110 Westwood Plaza, Los Angeles, CA 90095, USA.
Email: job.krijnen@anderson.ucla.edu

Funding information
Network for Studies on Pensions, Aging and Retirement

Abstract

In retirement saving, many people miss out on early opportunities to save and subsequently fail to take adequate actions for a long time thereafter. We examined whether these two observations—the initial failure to act and the subsequent inertia—could be related through the phenomenon of inaction inertia. In Experiment 1 (N = 180), participants were less likely to save for retirement when the difference in annual return between the current opportunity and the missed opportunity was large versus small. In Experiment 2 (N = 180), participants were less likely to start saving for retirement when reminded of a missed opportunity 10 years ago versus 1 year ago. These data constitute the first demonstration of inaction inertia in retirement saving: People's reluctance to act on attractive saving opportunities may be induced by their previous inaction. In Experiment 3 (N = 340) and Experiment 4 (N = 628), we find that the observed inertia is the product of a tendency to underestimate exponential growth combined with a focus on past opportunities. Building on this mechanism, Experiment 5 (N = 916) provided evidence for a potential remedy; the inaction inertia effect completely disappeared when focus was shifted from required contributions to future outcomes.

KEYWORDS

exponential growth bias, inaction inertia, inertia, missed opportunities, retirement saving

1 | INTRODUCTION

Many people are not taking full advantage of attractive opportunities to save for retirement. In the United States, a great number of eligible employees are not enrolled in tax-advantaged retirement plans (e.g., 401(k) or individual retirement account) or contribute only a small proportion of their income (Choi, Laibson, & Madrian, 2011; Helman, Copeland, & VanDerhei, 2015; Munnell & Sundén, 2006; Rhee, 2013). Such inertia in retirement saving is not unique to the United States. In countries with voluntary retirement saving schemes, enrollment rates are generally lower than expected (van Els, van Rooij, & Schuit, 2007). Inertia can even impact savings when enrollment is mandatory. For instance, in the 16 years following the introduction of a new mandatory pension scheme in Sweden in 1999, 72.6% of enrollees who had originally invested in the default fund had not made a single change to their portfolio (Cronqvist, Thaler, & Yu, 2018). What can explain this widespread and pervasive inertia in retirement saving? Why are so many people forgoing financially attractive opportunities to save more for retirement?

One explanation is that people do not fully appreciate the attractiveness of starting to save for retirement as early in life as possible. Keeping everything else constant, retirement saving decisions are a series of constantly worsening opportunities. Starting to save for retirement at age 26 results in substantially less retirement wealth than starting to save at age 25. Put differently, accumulating retirement wealth is cheapest if one starts saving as early as possible (Munnell, Golub-Sass, & Webb, 2011). Research confirms that many people underestimate the benefits of early saving (Eisenstein & Hoch, 2007; McKenzie & Liersch, 2011; Stango & Zinman, 2009). For instance, when college students were asked to calculate how much one should increase monthly saving to make up for a 20-year delay, given a fixed return of 5% or 10%, the modal responses ($200/month for both returns) were a vast underestimation of the correct answers ($365/month and $773/month for 5% and 10%, respectively;

McKenzie & Liersch, 2011). Most people seem to lack insight into the exponential growth of savings and the benefits of starting to save early.

Financial institutions, governments, employers, and individual financial advisors often attempt to educate the public about the importance of early retirement saving, working from the assumption that this will motivate people to act sooner. For example, the website of Fidelity Investments—the largest service provider of 401(k) retirement services in the United States—recommends consumers that "the single most important thing you can do is start saving early" because "the earlier you start to save, the lower your yearly savings rate needs to be" (Fidelity Investments, 2018). Another example is Investopedia.com (2016), a for-profit website providing investment advice to the general public. Investopedia.com has an entire page devoted to explaining "why your 20s are the perfect time to start saving for those post-work years." Such attempts to inform consumers about the importance of early saving can be effective. However, there is also a potential pitfall. Informing people about the benefits of early saving may remind them of attractive opportunities they have already missed. This reminder of a missed opportunity may inadvertently make people less instead of more inclined to start saving—a phenomenon called *inaction inertia* (Tykocinski, Pittman, & Tuttle, 1995).

1.1 | Inaction inertia

Consider a 35-year old woman who is given the opportunity to enroll in an attractive, employer-sponsored 401(k) plan. On a website for financial advice, such as Investopedia.com, she reads that it is best to start saving for retirement while in your 20s. This reminds her of the fact that she seriously considered enrolling in the same 401(k) plan some 10 years ago. How would this well-intended reminder affect her likelihood to enroll in the plan now that she is 35?

From a rational perspective, a history of missed opportunities should be irrelevant to people's evaluations of current opportunities and to the likelihood to act on these opportunities, because only future costs and benefits should matter for the decision. From a motivational perspective, one could reason that people for whom retirement saving is most pressing should be most inclined to enroll. Following this reasoning, it seems plausible that information about the attractiveness of missed opportunities may motivate people to act on subsequent opportunities.

Surprisingly, research suggests that people may not always adhere to either normative or motivational logic when it comes to dealing with missed opportunities (e.g., Tykocinski et al., 1995; Tykocinski & Pittman, 1998). An initial failure to act on an attractive opportunity can sometimes induce more inertia—a tendency called inaction inertia. Here is an example: Last week you forgot to buy your preferred brand of laundry detergent when it was on a steep discount. This week you return to the grocery store and see that the laundry detergent is still attractively priced, but not as cheap as last week. Normally, you would have been more than willing to buy the product for its current price. However, what research on inaction inertia suggests is that you would be less likely to do so under these circumstances, where you missed a much better opportunity the week before.

Inaction inertia has been observed for a wide variety of decisions such as buying groceries, signing up for a fitness center, enrolling in a university course, buying a ski pass, and betting on horse racing (Arkes, Kung, & Hutzel, 2002; Tykocinski et al., 1995; Tykocinski & Pittman, 1998; Zeelenberg, Nijstad, van Putten, & van Dijk, 2006). It has been linked to temporary dips in product sales after a promotion (Zeelenberg & van Putten, 2005), to failures and deadlocks in international negotiations (Terris & Tykocinski, 2016), to lower motivation to work on a crowdsource platform after missing a bonus (Mathmann, Higgins, Chylinski, & De Ruyter, 2017), and to investors' reluctance to leave bear markets (Tykocinski, Israel, & Pittman, 2004). In all these studies, people were less likely to act on an attractive opportunity when they had missed a much more attractive opportunity in the past (for reviews, see Tykocinski & Ortmann, 2011; van Putten, Zeelenberg, van Dijk, & Tykocinski, 2014; van Putten, Zeelenberg, & van Dijk, 2013).

The domain of retirement saving shares two characteristics with the instances where inaction inertia has been observed in the past. First, people often miss attractive opportunities to start saving when they are young and retirement is still decades away. Second, the attractiveness of saving opportunities can change rather abruptly. The prospected return of enrollment in a retirement plan fluctuates over time, just like the price of a laundry detergent in the local grocery store can fluctuate over time. Take, for example, the annualized S&P 500 return (dividends reinvested and inflation adjusted) as a proxy for the return on a retirement investment. Between January 1995 and January 2005, return would have been 8.96%. If one had waited 10 years and invested between January 2005 and January 2015, return would have been −3% (see https://dqydj.com/sp-500-return-calculator). Fluctuations in the attractiveness of retirement saving opportunities may also result from a change in employment status (e.g., losing a job that offered an employer-sponsored retirement plan) or a change in public policy (e.g., the abolition of a tax exemption on retirement contributions).

This combination of factors—a tendency to be inactive plus abruptly changing investment opportunities—prompted us to think that inaction inertia may occur in retirement decisions. Missing an opportunity to enroll in a retirement plan when prospected returns are high may decrease the likelihood of enrollment once the prospected returns are lower.

1.2 | Timing of opportunities

To date, most research on inaction inertia has examined situations where an abrupt change to an opportunity—a discount that ends, a stock price that falls—was necessary for inaction inertia to occur. We believe that in the context of retirement saving inaction inertia may occur even when there is no abrupt change in the prospected return. In retirement decisions, the passing of time after the missed opportunity can induce inaction inertia. At first sight, this prediction may seem

at odds with previous research that has found that time may weaken inaction inertia.

Consider a study by Tykocinski and Pittman (2001), which asked participants to imagine they had missed a large discount on a charter tour to Italy. One group of participants read that the attractive discount had ended yesterday. Another group read that the discount had ended 5 days earlier. Inaction inertia was observed among participants who read that only 1 day had passed since the initial opportunity, but the effect was absent among those who read that 5 days had passed since the initial opportunity. Later research suggested that this is an illustration of a more general pattern: People's likelihood to act on a current opportunity is affected less by the attractiveness of a missed opportunity to the extent that it is easier to mentally decouple the opportunities from each other (van Putten, Zeelenberg, & van Dijk, 2007). Time is one factor that can decouple two similar opportunities. As more time passes after having missed an opportunity, that initial opportunity becomes less relevant as a benchmark to evaluate the attractiveness of subsequent opportunities. As a result, the inaction inertia effect becomes attenuated or is completely absent when there is a longer time between the two opportunities.

If the passing of time decouples the current opportunity from the missed opportunity and attenuates inaction inertia, then why would we expect that the passing of time can induce inaction inertia in retirement decisions? To answer this question, we need to understand what sets retirement saving apart from most other domains where inaction inertia has been studied.

Holding everything else constant, opportunities to save for retirement constantly worsen over time. When comparing a current opportunity to save with an opportunity that was missed 10 years ago, the missed opportunity seems much more attractive than the opportunity to start saving today. The difference in attractiveness between the missed opportunity and the current opportunity increases only further as more time passes after having missed the initial opportunity. In fact, the forgone gains of a missed retirement saving opportunity—that is, how much a person could have saved by now if she or he had enrolled earlier—increase exponentially over time because of compounding returns. As mentioned before, most people systematically underestimate the exponential growth of an investment over time (see Eisenstein & Hoch, 2007; McKenzie & Liersch, 2011; Stango & Zinman, 2009). Hence, in a context of exponential growth, a missed opportunity will seem increasingly attractive as time passes, leading to the hypothesis that the passing of time will induce inaction inertia in retirement decisions.

The predicted inaction inertia effect is the product of a tendency to ruminate on missed opportunities combined with a tendency to underestimate exponential growth. Therefore, not all attempts to provide information about the exponential rate with which opportunities change over time will have the same effect. Consider an alternative case in which people are made aware of exponential growth through information about the rapid deterioration of future opportunities to save, instead of through information about past opportunities to save. Here, we expect that the current opportunity will seem financially attractive relative to the future opportunity. As a consequence, we predict the following pattern: Reminders of how saving opportunities will worsen from the present to the future will induce less inertia than will reminders of how saving opportunities have worsened from the past to the present.

1.3 | Shifting focus as a remedy for inaction inertia

If inaction inertia can indeed occur in retirement decisions as we propose, induced either by an abrupt change in expected returns or by the exponential worsening of saving opportunities over time, then this has important implications for how financial advisors and financial institutions should communicate to consumers. Explaining the relative attractiveness of early enrollment into a retirement plan may increase the likelihood of inertia for people who missed their chance to enroll early. Fortunately, we have reasons to suspect that an effective remedy to this problem is available—an intervention that would attenuate inaction inertia by focusing people's attention on future outcomes (i.e., how much money one would end up with at retirement age) instead of on contributions (i.e., how much money one would have to save every month).

Highlighting the potential growth of retirement savings increases motivation to start saving as early as possible (McKenzie & Liersch, 2011). We expect this positive effect to outweigh any negative effect caused by information about the relative attractiveness of a missed opportunity. When retirement saving opportunities are described in terms of required contributions, people will focus on the relative unattractiveness of the current opportunity, and we expect inaction inertia will occur. When opportunities are instead communicated in terms of expected outcomes, people will focus on the fact that both the missed opportunity and the current opportunity are undeniably attractive, and we expect inaction inertia will be attenuated or even absent.

A moderating effect of outcome (vs. contribution) focus on inaction inertia would fit well with previous findings indicating that a focus on opportunities for improvement in the present or in the future is associated with weaker inaction inertia, whereas a focus on the loss of missing past opportunities is associated with stronger inaction inertia. For instance, research found that inaction inertia did not occur when the current opportunity was framed as a gain instead of as a loss (Tykocinski et al., 1995) and when the attractiveness of the current opportunity was emphasized (see van Putten et al., 2013). Furthermore, people were found to experience more regret and feel more responsible for opportunities to be missed in the future than for equally attractive opportunities missed in the past (Shani, Danziger, & Zeelenberg, 2015). Inaction inertia was also found to be weaker when people were asked to think about multiple options being available in the present but stronger when they were asked to think about multiple options they missed in the past (van Putten, Zeelenberg, & van Dijk, 2008). Another study found that inaction inertia did not occur among people who were instructed to imagine that they had not much longer to live, a mental exercise that focuses people on the future and may lead to less rumination about the past (Strough, Parker, & Bruine de Bruin, 2019). Finally, inaction inertia was found

to be weaker among people who have a tendency to focus on present opportunities for improvement (i.e., an action-oriented mindset) compared with those who tend to dwell on the past (i.e., a state-oriented mindset; van Putten, Zeelenberg, & van Dijk, 2009). Taken together, a focus on potential gains in the future seems to be associated with weaker inaction inertia than does a focus on the losses of missed opportunities from the past. This supports our prediction that shifting the focus from contributions to outcomes may be an effective remedy to inaction inertia in retirement saving.

1.4 | Overview of studies

The remainder of this article discusses five experiments testing the hypotheses outlined above. First, we present two experiments examining the occurrence of inaction inertia in retirement saving as induced by a change in prospected annual return (Experiment 1) and by the exponential worsening of opportunities over time (Experiment 2). Then, we present one preregistered experiment testing the mediating role of estimated cost of inertia (Experiment 3), one preregistered experiment testing the moderating role of reminding people of a future opportunity versus past opportunity (Experiment 4), and one preregistered experiment testing the moderating role of describing saving opportunities in terms of outcomes versus contributions (Experiment 5). These studies provide insight into the situational factors that can induce inaction inertia, into the generalizability of the effect across domains and situations, and into the mechanisms driving the effect. From a practical perspective, these studies may also be useful in the search for interventions that aim to reduce retirement saving inertia. We will return to these contributions in section 7.

For all experiments, we recruited participants through Amazon's online crowdsourcing marketplace Mechanical Turk ("MTurk"). The use of MTurk and related services has quickly become common practice in behavioral research. It has been repeatedly found that MTurk participants are equally reliable and attentive as classical lab participants (i.e., students) while providing greater diversity in terms of the population they represent (e.g., Hauser & Schwarz, 2016; Huff & Tingley, 2015; Paolacci & Chandler, 2014; Paolacci, Chandler, & Ipeirotis, 2010), which is clearly an advantage when studying retirement saving. We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the experiments.

2 | EXPERIMENT 1

This first experiment tested whether inaction inertia can occur in retirement saving, as induced by a change in the prospected return on a retirement plan between opportunities to enroll. The experimental procedure was similar to the procedure that is standard in research on inaction inertia. Participants read about two opportunities to enroll in a retirement plan, both described in terms of expected annual return: one opportunity they missed and one current opportunity on which they can choose to act. Whereas the description of the current opportunity was the same for all participants, the description of the missed opportunity was varied between the two conditions. For one group, the difference in annual return between the missed opportunity and the current opportunity was small. For the other group, the difference in annual return between the missed opportunity and the current opportunity was large.

We hypothesized that people are less likely to enroll in the retirement plan under current conditions when the difference is large than when the difference is small. If confirmed, this would provide evidence that inaction inertia can be induced by a change in the annual return between a missed opportunity and a current opportunity to enroll in a retirement plan.

2.1 | Method

One hundred and eighty participants (42.8% female, M_{age} = 31.46, SD_{age} = 9.34) were randomly assigned to a large difference condition or a small difference condition.[1] Participants in the large difference [small difference] condition were asked to imagine the following scenario:

> *You work for Company A. When you started working for this company five years ago, you were offered the opportunity to enroll in their retirement plan. The plan offered a fixed annual return of 9% [4%] for the next 15 years. You thought that this was an attractive opportunity, but by the time you responded, the offer had expired.*

To make sure participants had read the scenario carefully, we asked: "If you would have enrolled in the retirement plan five years ago, what would have been your fixed annual return?" In both conditions, the possible answers were 4% and 9%. Participants could proceed to the next page only after correctly answering this question. In case of an incorrect answer, they were prompted with the question again until the answer was correct.

On the next page, participants read: "Now, five years later, you receive another letter about the retirement plan. If you enroll now, your fixed annual return would be lower: 3% for the next 15 years." As a dependent variable, we asked: "How likely is it that you would enroll in the retirement plan with the 3% fixed annual return?" Participants answered on a rating scale ranging from 1 (*very unlikely*) to 7 (*very likely*).

2.2 | Results and discussion

The results showed inaction inertia in retirement saving decisions. Participants in the large difference condition were less likely to enroll in the retirement plan (M = 3.59, SD = 1.54) than were participants in

[1]We aimed to recruit 180 participants, based on a power analysis for a t test (effect size d = 0.5, power 1 − β = .9, required N = 172).

[2]Including age as a covariate in an analysis of variance does not change the pattern of results. Age has no significant effect on the likelihood of enrollment (p = .91), and the effect of condition remains significant (p < .001).

the small difference condition (M = 4.61, SD = 1.58), $t(178)$ = 4.39, p < .001, Cohen's d = 0.65, 95% CI for Cohen's d [0.35, 0.95].[2]

This experiment demonstrates that inaction inertia can occur in a retirement saving context as result of a change in annual return. People indicated that they were less likely to enroll in a retirement plan after missing an opportunity that was much better than after missing an opportunity that was only slightly better. In the next experiment, we tested whether inaction inertia can also be induced in a different way—one that has not been considered by previous research.

3 | EXPERIMENT 2

We hypothesized that, in the context of retirement saving, the passing of time can induce inaction inertia because it is associated with exponential worsening of opportunities. Saving up enough money to live comfortably during retirement is relatively cheap if one starts early on in life but becomes more expensive the longer one waits. The difference in attractiveness between a focal opportunity and a missed opportunity increases as the time passed between the two increases. Experiment 2 tested whether participants would be less likely to enroll in an attractive retirement plan when reminded of a distant past (and thus much more attractive) opportunity, compared with when reminded of a recent past (and thus slightly more attractive) opportunity.

3.1 | Method

One hundred and eighty participants (28.9% female, M_{age} = 31.56, SD_{age} = 10.57) were randomly assigned to a 10-year condition or a 1-year condition.[3] Participants in the 10-year [1-year] condition were asked to imagine the following scenario[4]:

> *Ten years [One year] ago, when you started working for Company A, you were offered the possibility to enroll in the company's retirement plan. In a letter about the plan, it said: "If you put in $250 [$450] each month, you will be able to live comfortably during retirement."*

To make sure participants had read the scenario carefully, we asked "Ten years [One year] ago, how much money did you have to put in each month to live comfortably during retirement?" In both conditions, the possible answers were $450 and $250. Participants could proceed to the next page only after correctly answering this question. In case of an incorrect answer, they were prompted with the question again until the answer was correct.

On the next page, participants read:

> *The past 10 years [The past year] you repeatedly considered enrolling but you never got around to doing it. This week, you receive another letter about the possibility to enroll in the retirement plan. The letter says: "If you had enrolled 10 years ago [1 year ago], you would have put in $250 [$450] per month. To accumulate the same wealth, you would now have to put in $500 each month."*

As dependent variable, we asked: "Given that you would now have to put in $500 each month, how likely is it that you would enroll in the retirement plan this year?" Participants answered on a rating scale ranging from 1 (*very unlikely*) to 7 (*very likely*).

3.2 | Results and discussion

The results showed evidence for inaction inertia in retirement decisions induced by exponential worsening of opportunities over time. Participants in the 10-year condition were less likely to enroll in the retirement plan (M = 3.94, SD = 1.69) than were participants in the 1-year condition (M = 4.92, SD = 1.38), $t(178)$ = 4.26, p < .001, Cohen's d = 0.64, 95% CI for Cohen's d [0.33, 0.94].[5]

People indicated that they were less likely to enroll in a retirement plan when reminded of missing an opportunity 10 years ago, when required contributions were much lower, compared with when they were reminded of missing an opportunity 1 year ago, when required contributions were only slightly lower. Taken together, Experiments 1 and 2 demonstrate two ways in which inaction inertia can be induced in retirement saving—by a change in expected return and by the exponential worsening of opportunities over time. The prediction that the worsening of opportunities could induce inaction inertia was based on the assumption that people underestimate the exponential rate of change in opportunities. The next experiment directly tested this mechanism.

4 | EXPERIMENT 3

This experiment examined whether people's intuitions about the financial consequence of missing an opportunity mediates the inaction inertia effect. We predicted that participants who read about missing an opportunity to enroll in a retirement plan 10 years ago (at age 25) would estimate the required contribution at age 35 as lower compared with participants who read about missing an opportunity 1 year ago (at age 34), and that this difference in estimated contributions would drive the difference in likelihood to enroll at age 35. Before data collection, we preregistered the hypotheses, materials, inclusion criteria, and key analyses (see osf.io/6rnwg).

4.1 | Method

Of the 407 participants who completed the survey, 340 participants answered the attention check correctly and passed the other inclusion

[3]We aimed to recruit 180 participants, based on a power analysis for a t test (effect size d = 0.5, power 1 − β = .9, required N = 172).

[4]Required contributions are approximations of a scenario with 6.5% annual return (reinvested) and age 35 at time of the focal opportunity.

[5]Including age as a covariate in an analysis of variance does not change the pattern of results. Age has no significant effect on the likelihood of enrollment (p = .70), and the effect of condition remains significant (p < .001).

criteria (47.9% female, M_{age} = 39.16, SD_{age} = 12.64).[6] Only these participants (i.e., 83.5%) were included in the analyses.

The procedure in Experiment 3 was similar to that in Experiment 2. Participants were randomly assigned to a 10-year condition or a 1-year condition. Those in the 10-year [1-year] condition were asked to imagine the following scenario[7]:

> *Suppose you are 25 years [34 years] old right now. You recently started working at a new job. The company offers the possibility to enroll in the company's retirement plan. In a letter about the plan, it says: "If you contribute $250 [$450] every month, you will be able to live comfortably during retirement. This contribution of $250 [$450] per month is based on the assumptions thatThis sentence should start on a new line, just like the next sentence.*
> *..... the account earns 6.5% interest every year, compounded annually.*
> *... you retire 40 years [31 years] from now, at age 65.*
> *Please answer the following two questions, using the information that we provided."*

To make sure participants read the scenario carefully, we asked the following open-ended question: "According to the letter, how much money would you have to contribute every month to live comfortably during retirement?" Participants who did not provide the correct answer ($250 in the 10-year condition; $450 in the 1-year condition) could continue to complete the survey but were a priori excluded from analyses. Participants were asked the following open-ended question: "Suppose that you do not enroll at age 25 [age 34], but wait 10 years [1 year] and enroll at age 35. How much money would you have to contribute every month to accumulate the same retirement wealth? Please provide your thoughtful best guess." As preregistered, data from participants who provided an estimate lower than $250 [$450] or higher than $1,000 (twice the correct answer of $500) were excluded. We reasoned that these participants either did not read the instructions carefully or did not provide a thoughtful best guess.

On the next page, participants read:

> *Now suppose that it is 10 years [1 year] later. You are 35 years old. The past 10 years [the past year] you repeatedly considered enrolling into the company's retirement plan, but you never got around to doing it. This week, you receive another letter about the possibility to enroll in the retirement plan. The letter says: "If you had enrolled 10 years ago [1 year ago], you would have had to contribute $250 [$450] per month. To accumulate the same wealth, you would now have to contribute $500 every month."*

As a dependent variable, we asked: "Given the situation, how likely is it that you would enroll in the retirement plan this year?" Participants answered on a rating scale ranging from 1 (*very unlikely*) to 7 (*very likely*).

4.2 | Results and discussion

First, the results showed inaction inertia in retirement decisions induced by the passing of time. Participants in the 10-year condition were less likely to enroll in the retirement plan (M = 4.35, SD = 1.77) than do participants in the 1-year condition (M = 4.89, SD = 1.64), $t(338) = 2.93$, $p = .004$, Cohen's d = 0.32, 95% CI for Cohen's d [0.10, 0.53].[8] Second, participants in the 10-year condition estimated the required contribution at age 35 to be lower (M = $427.27, Mdn = $400.00, SD = $142.12) than did participants in the 1-year condition (M = $510.07, Mdn = $477.50, SD = $90.30), $t(286) = 6.41$, $p < .001$, Cohen's d = 0.70, 95% CI for Cohen's d [0.48, 0.92].

In a linear regression with condition and estimated contribution as predictors and likelihood to enroll as a dependent variable, the effect of condition was not significant, $\beta = -.08$, $t(337) = -1.50$, $p = .136$, whereas the negative effect of estimated contribution was significant, $\beta = .224$, $t(337) = 4.03$, $p < .001$. We used the mediation package in R by Tingley, Yamamoto, Hirose, Keele, and Imai (2014) to obtain the indirect effect and 95% CI from 1,000 bootstrap samples. This analysis showed a significant indirect effect of condition on likelihood to enroll via estimated contribution, $ab = -.26$, 95% CI [−0.37, −0.16], $p = .012$.

To further explore this mediation, we examined the likelihood of underestimating the required contribution at age 35 ($500 in both conditions). More participants in the 10-year condition underestimated (73.5%) than do those in the 1-year condition (58.8%), $\chi^2(1) = 7.57$, $p < .001$. Participants who underestimated the required contribution at age 35 indicated that they were less likely to enroll (M = 4.49, SD = 1.75) than did participants who did not underestimate the required contribution (M = 4.88, SD = 1.65), $t(242) = 1.99$, $p = .047$, Cohen's d = 0.22, 95% CI for Cohen's d [0.00, 0.45].

To summarize, Experiment 3 replicated the inaction inertia induced by the exponential worsening of opportunities over time from Experiment 2. Moreover, this experiment showed that inaction inertia in retirement saving is associated with a misunderstanding of how opportunities to start saving worsen over time. Combining our findings so far, we posit that retirement saving inertia can be the result of an attempt to provide insight into the exponential worsening of saving opportunities, but only when people are reminded of past opportunities and not when people are reminded of future opportunities. The next experiment directly tested this prediction.

[6]We aimed to recruit 400 participants, based on a power analysis for a t test (effect size d = 0.5, power 1 − β = .95, required N = 210) and assuming that we would have to exclude participants who failed to pass the preregistered exclusion criteria.

[7]The required contributions described in this scenario are approximations of the contributions needed for a saving scheme with 6.5% annual return (reinvested) and age 35 at time of the focal opportunity.

[8]Including age as a covariate in an analysis of variance does not change the pattern of results. Age has no significant effect on the likelihood of enrollment ($p = .39$), and the effect of condition remains significant ($p = .004$).

5 | EXPERIMENT 4

Experiment 4 tested the moderating role of reminding people of the exponential worsening of saving opportunities in the past versus future in retirement saving inertia. We hypothesized that inertia is induced by reminders of the exponential worsening of opportunities from the past to the present, but not (or less so) by reminders of the exponential worsening of opportunities from the present to the future. If confirmed, this would support our reasoning that retirement saving inertia results from a specific combination between the underestimation of exponential growth and reminders of missed opportunities. Before data collection, we preregistered the hypotheses, materials, inclusion criteria, and key analyses (see osf.io/m9zdk).

5.1 | Method

Of the 713 participants who completed the survey, 628 participants answered the attention check correctly (59.7% female, M_{age} = 35.92, SD_{age} = 10.80). Only these participants (i.e., 88.1%) were included in the analyses. Participants were randomly assigned to one of four groups of a 2 (difference: 1 vs. 10 years) × 2 (opportunity: past opportunity vs. future opportunity) between-subjects design.[9] Participants in all conditions read about a focal opportunity, where they could enroll in the company retirement plan and contribute $500 per month. In addition, participants in the past opportunity conditions read about what they would have had to contribute if they had enrolled at an earlier time, whereas participants in the future opportunity conditions read about what they would have to contribute if they would wait until a later time. Depending on the difference condition, the difference between the focal and nonfocal opportunities was 1 or 10 years.[10] Table 1 provides an overview of conditions and manipulations. Participants responded to an attention check and then indicated how likely they would be to enroll in the retirement plan this month (1 = *very unlikely*; 7 = *very likely*). Participants who answered the attention check incorrectly were excluded from analyses.

5.2 | Results and discussion

The results of Experiment 4, the mean and standard deviation of likelihood to enroll per condition, are shown in Table 1. As predicted, the ANOVA yielded a significant positive Difference × Opportunity interaction, $F(1, 624) = 16.107$, $p < .001$, $\eta_p^2 = .03$.[11]

When looking within the past opportunity conditions, participants in the 10-year condition were significantly less likely to enroll than do participants in the 1-year condition, $t(331) = 5.86$, $p < .001$, Cohen's $d = 0.64$, 95% CI for Cohen's d [0.42, 0.86]. This replicates the inaction inertia effect observed in Experiments 2 and 3. However, when looking within the future opportunity conditions, the difference in likelihood to enroll between the 10-year condition and the 1-year condition is not significant and in the opposite direction, $t(459) = -0.13$, $p = .897$, Cohen's $d = 0.02$, 95% CI for Cohen's d [−0.24, 0.21].

TABLE 1 Experiment 4: Mean likelihood to enroll (on a scale from 1 = *very unlikely* to 7 = *very likely*)

Opportunity condition			
10-year [1-year] condition	**1 year**	**10 years**	***p***
Past opportunity "If you had enrolled 10 years ago [1 year ago], you would have had to contribute $250 [$450] per month. If you enroll this month, you would have to contribute $500 per month."	4.60 (1.76)	3.44 (1.85)	<.001
Future opportunity "If you enroll this month, you would have to contribute $500 per month. If you would wait 10 years [1 year] before you enroll, you would have to contribute $1400 [$550] per month.	4.75 (1.97)	4.78 (1.83)	.90

Note. Standard deviations in parentheses for each condition.

Experiment 4 confirms that reminding people of the exponential worsening of saving opportunities by itself is not sufficient to cause inertia. Providing information about the exponential changes in saving opportunities from past to present can induce inaction inertia. Based on this knowledge, Experiment 5 examined the effectiveness of an intervention aimed at attenuating inaction inertia in retirement saving.

6 | EXPERIMENT 5

Experiment 5 tested the moderating role of focus in retirement saving inaction inertia. We hypothesized that shifting participants' focus from financial contributions to future financial outcome ("what you could have ended up with at retirement age") would attenuate the inaction inertia effect. If confirmed, this would lay the groundwork for a possible intervention to reduce retirement saving inertia.

Before conducting Experiment 5, we ran three separate experiments that each got at a part of the design reported in Experiment 5. A post hoc combination of the effects observed in these three experiments suggested evidence for a moderation effect, which we subsequently preregistered and formally tested in Experiment 5. Because these studies were not a priori designed to test for this effect, we did not include them in this article. Full details (methods and results) on these experiments—labeled Experiment A, B, and C—are provided in the Supporting Information (see osf.io/3n8x7). Experiment 5 was explicitly designed to test for the proposed moderation effect. Before data collection, we preregistered the hypotheses, materials, inclusion criteria, and key analyses (see osf.io/hdpkw).

[9]We aimed to recruit 700 participants, based on a power analysis for a F-test (effect size $f = 0.15$, power $1 - \beta = .90$, required $N = 469$) and assuming that we would have to exclude participants who failed to pass the preregistered exclusion criteria.

[10]Contributions were rounded estimates based on a scenario with 6.5% annual return (reinvested) and age 45 at time of the focal opportunity.

[11]Including age as a covariate in an analysis of variance does not change the pattern of results. Age has no significant effect on the likelihood of enrollment ($p = .68$). The interaction between difference and opportunity remains significant ($p < .001$).

6.1 | Method

Of the 1,037 participants who completed the survey, 916 participants answered the attention check correctly (53.9% female, M_{age} = 36.85, SD_{age} = 11.19). Only these participants (i.e., 88.3%) were included in the analyses. Participants were randomly assigned to one of four groups of a 2 (difference: 1 vs. 10 years) × 2 (focus: contribution vs. future outcome) between-subjects design.[12] The procedure in Experiment 5 was again similar to that in Experiments 1 and 2. Participants read about the missed opportunity to enroll in their company's retirement plan and responded to an attention check. They then read about the focal opportunity. As a dependent variable, participants indicated how likely they would be to enroll in the retirement plan this year (1 = *very unlikely*; 7 = *very likely*). Different from the procedure in Experiments 1 and 2, participants could proceed with the experiment if they answered the attention check incorrectly. Those participants were excluded from analyses.

Depending on the focus condition, the missed and focal opportunities were described in terms of required contribution or in terms of expected outcome at retirement age.[13] Depending on the difference condition, the difference between the missed and focal opportunities was 1 or 10 years. For instance, participants in the 10-year future outcome condition read:

> *Ten years ago, when you started working for Company A, you were offered the possibility to enroll in the company's retirement plan. In a letter about the plan, it said: "If you start saving now, you will end up with $367,000 in retirement savings at age 65."*

On the next page, after answering the attention check, participants in the 10-year future outcome condition read:

> *The past 10 years, you repeatedly considered enrolling but you never got around to doing it. This week, you receive another letter about the possibility to enroll in the retirement plan. The letter says: "If you had enrolled 10 years ago, you would have ended up with $367,000 at age 65. Because you did not enroll, you will end up with $148,000 at age 65 if you enroll this month."*

Table 2 provides an overview of conditions and manipulations.

TABLE 2 Experiment 5: Mean likelihood to enroll (on a scale from 1 = *very unlikely* to 7 = *very likely*)

Focus condition			
10-year [1-year] condition	**1 year**	**10 years**	***p***
Contribution focus "If you had enrolled 10 years ago [1 year ago], you would have put in $250 [$450] per month. To accumulate the same wealth, you would now have to put in $500 each month."	4.72 (1.66)	3.84 (1.76)	<.001
Future outcome focus "If you had enrolled 10 years ago [1 year ago], you would have ended up with $367,000 [$163,000] at age 65. Because you did not enroll, you will end up with $148,000 at age 65 if you enroll this month."	5.59 (1.37)	5.64 (1.35)	.66

Note. Standard deviations in parentheses for each condition.

6.2 | Results and discussion

The results of Experiment 5, the mean and standard deviation of likelihood to enroll per condition, are shown in Table 2. The ANOVA yielded a significant positive Difference × Focus interaction, F(1, 912) = 20.960, p < .001, η_p^2 = .02.[14]

When looking within the contribution conditions, participants in the 10-year condition were significantly less likely to enroll than were participants in the 1-year condition, t(453) = 5.46, p < .001, Cohen's d = 0.51, 95% CI for Cohen's d [0.33, 0.70]. This replicates the inaction inertia effect observed in Experiments 2, 3, and 4. However, when looking within the future outcome conditions, no significant difference in likelihood to enroll between the 10-year condition and the 1-year condition is observed, t(459) = −0.44, p = .657, Cohen's d = 0.04, 95% CI for Cohen's d [−0.14, 0.22].

Experiment 5 thus reveals an important insight concerning the boundary conditions of inaction inertia in retirement saving. The inaction inertia effect, as induced by the passing of time between the missed and focal opportunities, was completely absent when both opportunities were described in terms of future outcomes instead of required contributions. Focusing on future outcomes when communicating retirement saving opportunities may be an effective remedy against inaction inertia.

7 | GENERAL DISCUSSION

Inertia in retirement saving is both common and consequential. Many people do not adhere to the financial advice to start saving for retirement early in life, as indicated by surprisingly low participation rates in retirement plans that are financially attractive (Choi et al., 2011;

[12]The results of previous experiments (see the Supporting Information) suggested an interaction effect size of partial η^2 = .01. We therefore aimed to recruit 1,050 participants, based on a power analysis for an F test (effect size f = 0.1, power 1 − β = .90, required N = 1,043).

[13]Contribution, present outcome, and future outcome were all based on a scenario with 8% annual return (reinvested) and age 45 at time of the focal opportunity.

[14]Including age as a covariate in an analysis of variance does not change the pattern of results. Age has no significant effect on the likelihood of enrollment (p = .15). The interaction between difference and focus remains significant (p < .001).

Cronqvist et al., 2018; Madrian & Shea, 2001; Thaler & Benartzi, 2004). Financial institutions, governments, employers, and financial advisors attempt to spur consumers to action by informing them about the relative attractiveness and importance of early retirement saving opportunities. In the current article, we demonstrated the possibility of an unwanted side effect to this strategy. Focusing people's attention on the attractive opportunities that they have missed may cause more instead of less saving inertia.

In the first two experiments, we examined whether and how information about missed saving opportunities affected people's likelihood to act on current saving opportunities. We found that, in the context of retirement saving, inaction inertia can be induced in two ways. First, inaction inertia can be induced by a change in expected return on investment. People were less likely to act on a saving opportunity when reminded of a missed opportunity with a much higher return, than when reminded of a missed opportunity with a slightly higher return. A second way in which inaction inertia can be induced in the retirement context is by the worsening of saving opportunities over time. People were less likely to act on a saving opportunity when reminded of a missed opportunity from 10 years ago, than when reminded of a missed opportunity from 1 year ago. In a third experiment, we found evidence that inaction inertia in retirement saving is associated with a tendency to underestimate the exponential rate with which opportunities worsen over time. A fourth experiment showed that providing information about the exponential changes in saving opportunities from past to present can induce inertia, but that providing information about the exponential changes in saving opportunities from present to future does not have this effect.

Taken together, these findings suggest that retirement saving is a naturalistic setting where inaction inertia is likely to occur. This improves our understanding of inertia in retirement saving decisions, as well as our understanding of the role of time in inaction inertia by extending results to situations of exponential rather than abrupt decreases in attractiveness and to situations where passing time may increase rather than attenuate the effects of inaction inertia.

Experiment 5 demonstrated that inaction inertia in retirement saving disappears when opportunities are described in terms of future outcomes instead of required contributions. This finding is in line with previous research showing that inaction inertia is diminished or absent if people (1) focus on gains (Tykocinski et al., 1995), (2) focus on the positive aspects of the opportunity (van Putten et al., 2013), (3) are confronted with multiple options in the present (van Putten et al., 2008), or (4) focus on possible improvement (van Putten et al., 2009). We reason that when saving opportunities are described in terms of future outcomes, people's attention is focused on the absolute attractiveness of the current opportunity instead of on its unattractiveness relative to the missed opportunity. This shift in focus counteracts the inaction inertia effect.

The pattern of results also seems to indirectly support a sour grapes explanation of inaction inertia, which has been proposed and examined in previous work (van Putten et al., 2014; Zeelenberg et al., 2006). According to this explanation, people respond to missing out on an attractive opportunity by downplaying its attractiveness, which consequently reduces the attractiveness of subsequent, related opportunities. This devaluation may be driven by a motivation to minimize the experience of regret. We have no direct evidence to support this explanation because the current experiments were not designed for this purpose. However, the results of Experiment 5 do suggest that retirement saving inaction inertia is less likely to occur once it becomes difficult, if not impossible, to downplay the attractiveness of the missed and current saving opportunities. People who missed an early saving opportunity may be fooling themselves into believing that this opportunity was not so attractive after all. This form of self-deception, which leads to continued inertia, becomes unlikely when it is made clear that the past and current opportunities are undeniably attractive.

The experiments in this article asked participants to indicate their likelihood of enrollment in a retirement plan given a hypothetical situation. Ideally, we would attempt to generalize our key findings to a setting with actual, long-term financial outcomes. Such an approach would require us to randomly assign people to missing different retirement saving opportunities, something that seems both implausible and unethical. A more realistic option would be to conduct a smaller stakes conceptual replication where people are randomly assigned to missing different short-term investment opportunities. However, such short-term investments would have the disadvantage of not providing the appropriate context for a conceptual replication, given the finding in this article that inaction inertia in retirement saving is in part driven by people's underestimation of how rapidly opportunities worsen over long periods of time. A third option would be to extend the current set of experimental studies with correlational evidence supporting the possibility of inaction inertia induced by the exponential worsening of retirement saving opportunities over time. Unfortunately, such an approach also appears to be problematic. Our prediction is not that people become less likely to start saving for retirement as they become older. Instead, our prediction is that people who are reminded of attractive missed opportunities from early in life are less likely to act on current opportunities compared with those who are either reminded of more recent missed opportunities or not reminded of missed opportunities at all.

The current findings do provide practical considerations for choice and information architects who hope to motivate people to start saving for retirement, such as policymakers, financial advisors, and personnel managers. Educating consumers about the progressive nature of retirement saving has been suggested as a promising way to motivate saving. In fact, research has found that people increase their retirement contribution after seeing in a graph how savings grow over time (Goda, Manchester, & Sojourner, 2014; McKenzie & Liersch, 2011). The strategy of emphasizing the importance of early saving for retirement seems sensible at first sight but may have some surprising and sometimes even detrimental effects on people's decisions. Past research finds that perceptions of retirement saving importance are not as directly predictive of people's retirement preparations as policymakers seem to assume (Krijnen, Zeelenberg, Breugelmans, & van der Schors, 2019), and that emphasizing the importance of retirement saving decisions can even cause people to postpone their

enrollment in a seemingly attractive retirement plan (Krijnen, Zeelenberg, & Breugelmans, 2015). Our current data adds another reason to be careful: Some forms of financial education run the risk of backfiring by reminding people of the attractiveness of missed opportunities, causing more rather than less inertia.

Inaction inertia may explain why providing peer information, as another way to motivate employees' retirement saving, has been found to backfire. Kumar (2004) demonstrated that social comparisons can induce inaction inertia in purchase decisions. In a recent field experiment, Beshears, Choi, Laibson, Madrian, and Milkman (2015) found that providing employees with peer information led to lower retirement plan enrollment. Information about other people (e.g., coworkers) who did choose to take advantage of earlier, better opportunities to save can serve as a painful reminder of what could have been. As we have shown in this article, such reminders can increase the likelihood of retirement saving inertia.

On a more optimistic note, the current findings, as well as the broader literature, provide suggestions for how inaction inertia can be countered. The risk of people falling prey to inaction inertia seems smallest when saving opportunities are communicated in terms of future outcomes or gains (see also Tykocinski et al., 1995; van Putten et al., 2009; van Putten et al., 2014) or when they are directly pitted against the possibility to miss attractive opportunities in the present or future (Shani et al., 2015). Providing information about savings growth is likely to work best (1) when tailored to the situation of the individual recipient, (2) when focused on the present and future rather than on the past, and (3) when described in terms of expected outcomes instead of in terms of necessary contributions. An organization should not attempt to inform employees who are in the later stages of their career about the fact that starting to save while young would have been ideal. Not only is this information of little relevance to their individual case, it can even induce continued inertia. Instead, it seems best to battle retirement saving inertia by explaining what can still be done to accumulate sufficient retirement wealth.

ACKNOWLEDGEMENT

This work was by a grant from Network for Studies on Pensions, Aging and Retirement.

ORCID

Job M.T. Krijnen https://orcid.org/0000-0001-5269-8330
Marcel Zeelenberg https://orcid.org/0000-0002-7100-4223

REFERENCES

Arkes, H. R., Kung, Y. H., & Hutzel, L. (2002). Regret, valuation, and inaction inertia. *Organizational Behavior and Human Decision Processes*, *87*, 371–385. https://doi.org/10.1006/obhd.2001.2978

Beshears, J., Choi, J. J., Laibson, D., Madrian, B. C., & Milkman, K. L. (2015). The effect of providing peer information on retirement savings decisions. *Journal of Finance*, *70*, 1161–1201. https://doi.org/10.1111/jofi.12258

Choi, J. J., Laibson, D., & Madrian, B. C. (2011). $100 bills on the sidewalk: Suboptimal investment in 401(k) plans. *Review of Economics and Statistics*, *93*, 748–763. https://doi.org/10.1162/REST_a_00100

Cronqvist, H., Thaler, R. H., & Yu, F. (2018). When nudges are forever: Inertia in the Swedish Premium Pension Plan. *AEA Papers and Proceedings*, *108*, 153–158. https://doi.org/10.1257/pandp.20181096

Eisenstein, E., & Hoch, S. (2007). Intuitive compounding: Framing, temporal perspective, and expertise. Fox School of Business Working Paper, Temple University, Philadelphia, PA.

Goda, G. S., Manchester, C. F., & Sojourner, A. J. (2014). What will my account really be worth? Experimental evidence on how retirement income projections affect saving. *Journal of Public Economics*, *119*, 80–92. https://doi.org/10.1016/j.jpubeco.2014.08.005

Hauser, D. J., & Schwarz, N. (2016). Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants. *Behavior Research Methods*, *48*, 400–407. https://doi.org/10.3758/s13428-015-0578-z

Helman, R., Copeland, C., & VanDerhei, J. (2015). The 2015 retirement confidence survey: Having a retirement savings plan a key factor in Americans' retirement confidence. *EBRI.org Issue Brief*, 413.

Huff, C., & Tingley, D. (2015). "Who are these people?" Evaluating the demographic characteristics and political preferences of MTurk survey respondents. *Research & Politics*, *2*, 1–12.

Fidelity Investments (2018). How much should I save for retirement? Retrieved from https://www.fidelity.com/viewpoints/retirement/how-much-money-should-I-save

Investopedia.com (2016). Why save for retirement in your 20s? Retrieved from http://www.investopedia.com/articles/personal-finance/040315/why-save-retirement-your-20s.asp

Krijnen, J. M. T., Zeelenberg, M., & Breugelmans, S. M. (2015). Decision importance as a cue for deferral. *Judgment and Decision Making*, *10*, 407–415.

Krijnen, J. M. T., Zeelenberg, M., Breugelmans, S. M., & Van der Schors, A. (2019). Intention and action in retirement preparation. *Behavioural Public Policy*., 1–22. https://doi.org/10.1017/bpp.2018.39

Kumar, P. (2004). The effects of social comparison on inaction inertia. *Organizational Behavior and Human Decision Processes*, *95*, 175–185. https://doi.org/10.1016/j.obhdp.2004.06.004

Madrian, B. C., & Shea, D. F. (2001). The power of suggestion: Inertia in 401(k) anticipation and savings behavior. *Quarterly Journal of Economics*, *116*, 1149–1187. https://doi.org/10.1162/003355301753265543

Mathmann, F., Higgins, E. T., Chylinski, M., & de Ruyter, K. (2017). When size matters: Sensitivity to missed opportunity size increases with stronger assessment. *Personality and Social Psychology Bulletin*, *43*, 1427–1439. https://doi.org/10.1177/0146167217717244

McKenzie, C. R., & Liersch, M. J. (2011). Misunderstanding savings growth: Implications for retirement savings behavior. *Journal of Marketing Research*, *48*(SPL), S1–S13. https://doi.org/10.1509/jmkr.48.SPL.S1

Munnell, A. H., Golub-Sass, F., & Webb, A. (2011). How much to save for a secure retirement. Center for Retirement Research at Boston College Report 11–13.

Munnell, A. H., & Sundén, A. (2006). 401(k) plans are still coming up short. Center for Retirement Research at Boston College Report 06–43.

Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science*, *23*, 184–188. https://doi.org/10.1177/0963721414531598

Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making*, *5*, 411–419.

Rhee, N. (2013). The retirement savings crisis: Is it worse than we think? National Institute on Retirement Security, June.

Shani, Y., Danziger, S., & Zeelenberg, M. (2015). Choosing between options associated with past and future regret. *Organizational Behavior and Human Decision Processes*, *126*, 107–114. https://doi.org/10.1016/j.obhdp.2014.11.001

Stango, V., & Zinman, J. (2009). Exponential growth bias and household finance. *Journal of Finance*, *64*, 2807–2849. https://doi.org/10.1111/j.1540-6261.2009.01518.x

Strough, J., Parker, A. M., & Bruine de Bruin, W. (2019). Restricting future time perspective reduces failure to act after a missed opportunity. *Psychology and Aging*, *34*, 311–316. https://doi.org/10.1037/pag0000301

Terris, L. G., & Tykocinski, O. E. (2016). Inaction inertia in international negotiations: The consequences of missed opportunities. *British Journal of Political Science*, *46*, 701–717. https://doi.org/10.1017/S0007123414000118

Thaler, R. H., & Benartzi, S. (2004). Save More Tomorrow™: Using behavioral economics to increase employee saving. *Journal of Political Economy*, *112*(S1), S164–S187. https://doi.org/10.1086/380085

Tingley, D., Yamamoto, T., Hirose, K., Keele, L., & Imai, K. (2014). mediation: R package for causal mediation analysis. *Journal of Statistical Software*, *59*, 1–38.

Tykocinski, O. E., Israel, R., & Pittman, T. S. (2004). Inaction inertia in the stock market. *Journal of Applied Social Psychology*, *34*, 1166–1175. https://doi.org/10.1111/j.1559-1816.2004.tb02001.x

Tykocinski, O. E., & Ortmann, A. (2011). The lingering effects of our past experiences: The sunk-cost fallacy and the inaction-inertia effect. *Social and Personality Psychology Compass*, *5*, 653–664. https://doi.org/10.1111/j.1751-9004.2011.00369.x

Tykocinski, O. E., & Pittman, T. S. (1998). The consequences of doing nothing: Inaction inertia as avoidance of anticipated counterfactual regret. *Journal of Personality and Social Psychology*, *75*, 607–616. https://doi.org/10.1037/0022-3514.75.3.607

Tykocinski, O. E., & Pittman, T. S. (2001). Product aversion following a missed opportunity: Price contrast or avoidance of anticipated regret? *Basic and Applied Social Psychology*, *23*, 149–156. https://doi.org/10.1207/S15324834BASP2303_1

Tykocinski, O. E., Pittman, T. S., & Tuttle, E. E. (1995). Inaction inertia: Foregoing future benefits as a result of an initial failure to act. *Journal of Personality and Social Psychology*, *68*, 793–803. https://doi.org/10.1037/0022-3514.68.5.793

van Els, P. J. A., van Rooij, M. C. J., & Schuit, M. E. J. (2007). Why mandatory retirement saving? In O. Steenbeek, & S. van der Lecq (Eds.), *Costs and benefits of collective pension systems* (pp. 159–186). Berlin: Springer. https://doi.org/10.1007/978-3-540-74374-3_9

van Putten, M., Zeelenberg, M., & van Dijk, E. (2007). Decoupling the past from the present attenuates inaction inertia. *Journal of Behavioral Decision Making*, *20*, 65–79. https://doi.org/10.1002/bdm.541

van Putten, M., Zeelenberg, M., & van Dijk, E. (2008). Multiple options in the past and the present: The impact on inaction inertia. *Journal of Behavioral Decision Making*, *21*, 519–531. https://doi.org/10.1002/bdm.599

van Putten, M., Zeelenberg, M., & van Dijk, E. (2009). Dealing with missed opportunities: Action vs. state orientation moderates inaction inertia. *Journal of Experimental Social Psychology*, *45*, 808–815. https://doi.org/10.1016/j.jesp.2009.05.011

van Putten, M., Zeelenberg, M., & van Dijk, E. (2013). How consumers cope with missed discounts: Transaction decoupling, action orientation and inaction inertia. *Journal of Economic Psychology*, *38*, 104–110. https://doi.org/10.1016/j.joep.2012.09.008

van Putten, M., Zeelenberg, M., van Dijk, E., & Tykocinski, O. E. (2014). Inaction inertia. *European Review of Social Psychology*, *24*, 123–159.

Zeelenberg, M., Nijstad, B. A., van Putten, M., & van Dijk, E. (2006). Inaction inertia, regret, and valuation: A closer look. *Organizational Behavior and Human Decision Processes*, *101*, 89–104. https://doi.org/10.1016/j.obhdp.2005.11.004

Zeelenberg, M., & van Putten, M. (2005). The dark side of discounts: An inaction inertia perspective on the post-promotion dip. *Psychology & Marketing*, *22*, 611–622. https://doi.org/10.1002/mar.20076

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

How to cite this article: Krijnen JMT, Zeelenberg M, Breugelmans SM, van Putten M. Inaction inertia in retirement saving. *J Behav Dec Making*. 2020;33:52–62. https://doi.org/10.1002/bdm.2145